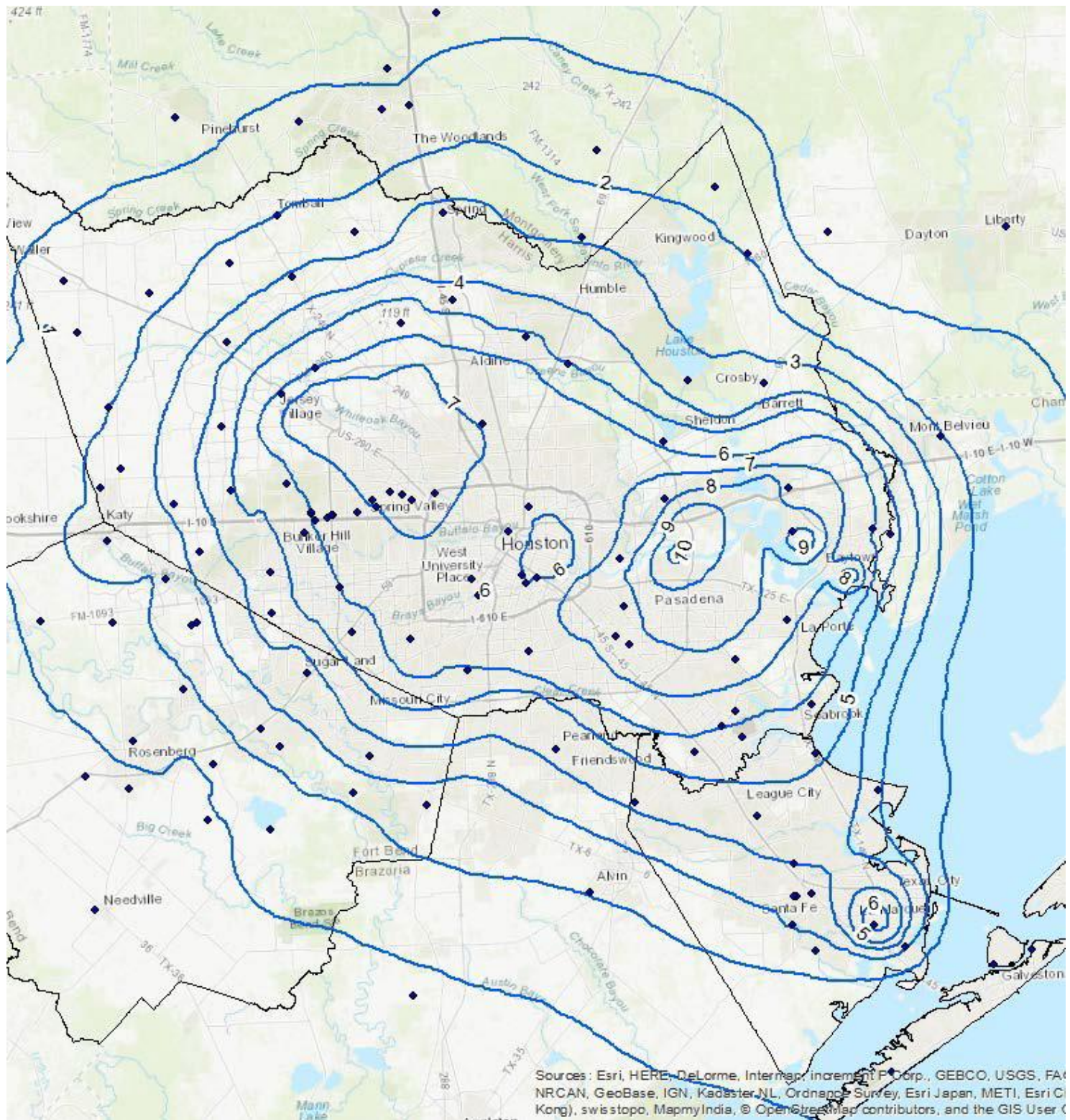


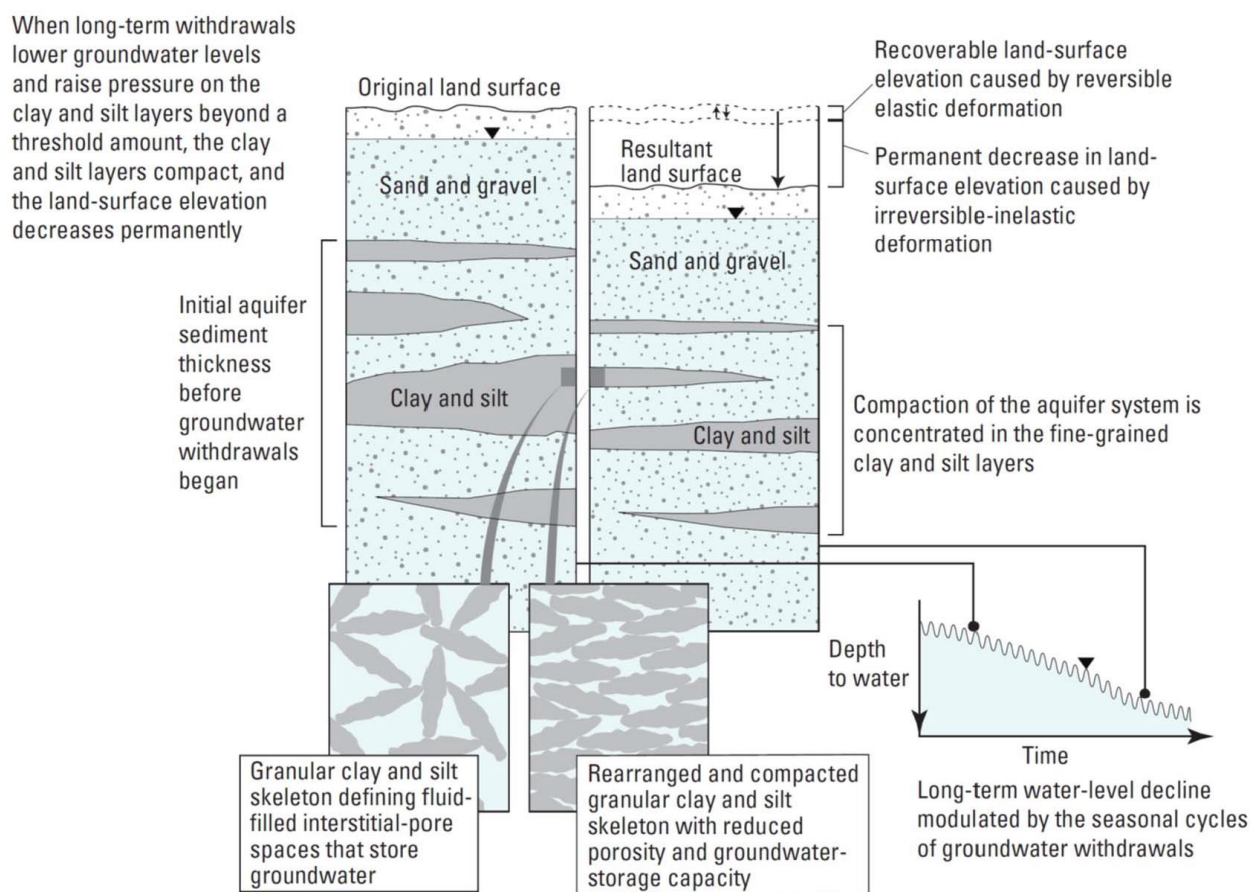
# November 2017 Newsletter



**Subsidence** in feet, 1906-2016, Harris-Galveston, Texas (Harris-Galveston Subsidence District, November 22, 2017)

Houston Metropolitan area expects to soon become America's third largest metropolitan area, replacing Chicago. My 60s' work discovered a fresh, hot, artesian groundwater supply. But it was over-pumped and saline-water intruded. My nearby work on the Brazos River found the dams were accumulating heavier, colder and more saline Permian Basin surface water, making it undrinkable. Texas agencies are replacing once predominately groundwater supplies with Trinity River water to reduce subsidence rates which have serious adverse effects on drainage, habitats and constructed infrastructure. In note accelerated subsidence in NW Harris County: buildings constructed on ground-level concrete pads languish on aboveground pads, some underlain by open-air pockets as soil collapses from mass wasting and clay dewatering. Ultimately the region will depend more on the growing trend to use treated wastewater effluent and imported desalinated seawater. San Antonio already is desalinating mineralized groundwater to reduce dependency on the Edwards Aquifer.

The Metropolitan area has over 300 active faults, ten salt domes, 600 municipal utility districts (MUD) providing water and sewer services, plus several city operated water and wastewater systems. Regional planning must come into play especially after numerous hurricanes and flooding events are adversely impacting the region.



*Explanation of clay-dewatering induced land subsidence in Houston (HGSD, July 20, 2016).*

I'm in Houston for infrastructure recovery. Very much enjoying this great city where I lived in the mid-60's and early 80's before its superhighways, skyways, light rail and toll roads. Having a Thanksgiving Party with coworkers this afternoon. Over the past few months here, I attended Verdi's Traviata, Handel's Julius Caesar, Gilbert & Sullivan Concert, Veterans' Concert, two children's plays, and Ionesco Rhinoceros, plus learned much about various public assistance infrastructure inspections, failures, environmental and historic protection, and mitigation. TIP: If you go to the Grand Opera, do not have a drink as you might sleep through much of it.